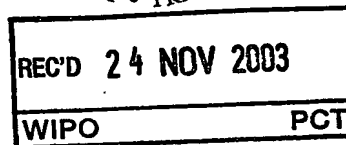


Rec'd PCT/PTO 18 MAY 2003



INVESTOR IN PEOPLE

The Patent Office
Concept House
Cardiff Road
Newport
South Wales
NP10 8QQ

I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

In accordance with the Patents (Companies Re-registration) Rules 1982, if a company named in this certificate and any accompanying documents has re-registered under the Companies Act 1980 with the same name as that with which it was registered immediately before re-registration save for the substitution as, or inclusion as, the last part of the name of the words "public limited company" or their equivalents in Welsh, references to the name of the company in this certificate and any accompanying documents shall be treated as references to the name with which it is so re-registered.

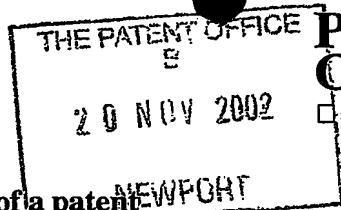
In accordance with the rules, the words "public limited company" may be replaced by p.l.c., plc, P.L.C. or PLC.

Re-registration under the Companies Act does not constitute a new legal entity but merely subjects the company to certain additional company law rules.

Signed

Dated 13 August 2003

PRIORITY DOCUMENT
SUBMITTED OR TRANSMITTED IN
COMPLIANCE WITH
RULE 17.1(a) OR (b)



The
Patent
Office

1/77

Request for grant of a patent
(See notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

20 NOV 2002

The Patent Office
Cardiff Road
Newport
Gwent NP10 8QQ

.. Your reference PHGB020197
20NOV02 F764798-1 D02879
P01/7700 0.00-0227027.0

2. Patent application number
(The Patent Office will fill in this part) **0227027.0**

1. Full name, address and postcode of the or of each applicant (underline all surnames)
KONINKLIJKE PHILIPS ELECTRONICS N.V.
GROENEWOUDSEWEG 1
5621 BA EINDHOVEN
THE NETHERLANDS

Patents ADP Number (if you know it) 07419294001 ✓

If the applicant is a corporate body, give the country/state of its incorporation THE NETHERLANDS

1. Title of the invention A METHOD OF DISTRIBUTING THE LOCATION OF A MOBILE DEVICE

1. Name of your agent (if you have one)
"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)
Patents ADP number (if you know it)

Philips Intellectual Property and Standards
Cross Oak Lane
Redhill
Surrey RH1 5HA
08359655001 ✓

1. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country	Priority Application number (if you know it)	Date of filing (day/month/year)

1. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing (day/month/year)

1. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer "Yes" if:

a) any applicant named in part 3 is not an inventor, or

b) there is an inventor who is not named as an applicant, or

c) any named applicant is a corporate body.

See note (d))

YES

Patents Form 1/77

Indicate the number of sheets for any of the following
as you are filing with this form.
Do not count copies of the same document.

Continuation sheets of this form

Description	5
Claims(s)	2
Abstract	1
Drawings	1

3. If you are also filing any of the following,
state how many against each item:

Priority Documents

Translations of priority documents
Statement of inventorship and right
to grant of a patent (*Patents Form 7/77*)
Request for preliminary examination and
search (*Patents Form 9/77*)
Request for substantive examination
(*Patents Form 10/77*)
Any other documents
(*Please specify*)

1. I/We request the grant of a patent on the basis of this application.

Signature

Stamand

Date

18/11/2002

2. Name and daytime telephone number of
person to contact in the United Kingdom

01293 815339

(S. Townsend)

Warning

After an application for a patent has been filed, the Comptroller of the Patent Office will consider whether publication or communication of the invention should be prohibited or restricted under Section 22 of the Patents Act 1977. You will be informed if it is necessary to prohibit or restrict your invention in this way. Furthermore, if you live in the United Kingdom, Section 23 of the Patents Act 1977 stops you from applying for a patent abroad without first getting written permission from the Patent Office unless an application has been filed at least 6 weeks beforehand in the United Kingdom for a patent for the same invention and either no direction prohibiting publication or communication has been given, or any such direction has been revoked.

Notes

- 1. If you need help to fill in this form or you have any questions, please contact the Patent Office on 0645 500505.
 - 2. Write your answers in capital letters using black ink or you may type them.
 - 3. If there is not enough space for all the relevant details on any part of this form, please continue on a separate sheet of paper and write "see continuation sheet" in the relevant part(s). Any continuation sheet should be attached to this form.
 - 4. If you have answered "Yes" Patents Form 7/77 will need to be filed.
 - 5. Once you have filled in the form you must remember to sign and date it.
- For details of the fee and ways to pay please contact the Patent Office.

DESCRIPTION**A METHOD OF DISTRIBUTING THE LOCATION OF A MOBILE DEVICE**

5 The invention relates to a method of distributing the location of a mobile device together with a mobile device, server and terminal for the same.

US patent application, publication number US2001/0044309 discloses an "Internet distributed real-time wireless location database" for "distributing
10 real time location information of cellular telephone users to various third party information subscribers using an HTTP server machine which maintains a dynamic database of current cellular users. The database has a list of caller entries, where each entry typically comprises a user ID number, such as a phone number, mobile ID number, and/or handset serial ID. The entry also
15 includes, for each user ID number, a user location identifier such as a latitude and longitude, a sector number, a caller or called phone number and/or a street address. The HTTP server is connected to the internet so that registered third party information subscribers have access to the database by means of standard HTTP protocols that ensure authentication and provide encryption for
20 security. Using caller ID or other means for obtaining a caller's phone number, the third party subscriber can obtain, via a simple internet query, the current location of the caller by submitting the phone number to the HTTP server using an HTML form. Software on the central server machine verifies the authenticity of the subscriber, looks up the location information in the database, and
25 returns the information to the subscriber. The subscriber can then use the location information to provide any of a wide range of services to the caller, or to dispatch emergency vehicles to the location of the caller. In addition, the server can directly provide many location-based services to callers."

30 It is the object of the invention to provide a method of distributing the location of a mobile device which safeguards the privacy of the user of the mobile device.

In accordance with the present invention, such a method comprises the steps of determining the location of the mobile device; encrypting the determined location using an encryption key; transmitting the encrypted location to a server; storing the encrypted at the server; querying the server from a remote terminal; transmitting from the server to the remote terminal the encrypted location in response to the query; sharing the predetermined encryption key between the mobile device and the remote terminal; and decrypting the location at the remote terminal using the predetermined encryption key.

Such a method enables a server to support such distribution of location information in a manner in which the server and / or entity operating the server is unable to make decrypt the location information to determine the movements of the user of the mobile device.

Also provided in accordance with the present invention is a corresponding mobile device, server and terminal as claimed in claims 3 to 5.

The present invention will now be described, by way of example only, with reference to the accompanying schematic drawings in which:

Figure 1 shows identical mobile cellular telephones MS1 and MS2 communicating via respective nearby cellular telephone network base stations BS1 and BS2 and a public switched telephone network (PSTN) with a remote, Internet based information server (IS) in accordance with the present invention;

Figure 2 shows mobile cellular telephones MS1 and MS2 of figure 1 in greater detail; and

Figure 3 shows the remote, Internet based information server (IS) of figure 1 in greater detail.

Figure 1 shows identical mobile cellular telephones MS1 and MS2 in possession of respective users (not shown) and registered with respective nearby cellular telephone network base stations BS1 and BS2 facilitating voice

and data communication via their respective base stations and the corresponding cellular telephone network. Data communication is intended to include sending text messages (for example using the short message service (SMS) protocol) and accessing the Internet (for example using WAP or i-mode protocols). In particular, mobile telephones MS1 and MS2 are communicating
5 via their respective base station and a public switched telephone network PSTN with a remote, Internet based information server IS in a manner according to the present invention.

In figure 2, telephones MS1 and MS2 is shown in greater detail, each
10 comprising a communications transmitter (Tx) and receiver (Rx) 20 connected to a communications antenna 21 and controlled by a communications microprocessor (μ p) 22 for communication with the base station BS with which it is registered. Telephones MS1 and MS2 each further comprise a GPS receiver (GPS Rx) 23 connected to a GPS antenna 24. Also, the
15 communications microprocessor (μ p) 22 is further configured to acquire and track GPS signals for the purpose of deriving pseudorange information from which the location of the mobile telephone can be determined using conventional navigation algorithms. Such methods for GPS signal acquisition, tracking and position determination are well known, for example, GPS
20 Principles and Applications (Editor, Kaplan) ISBN 0-89006-793-7 Artech House. Also, the design and manufacture of telephones of the type of telephones MS1 and MS2 are well known and those parts which do not directly relate to the present invention will not be elaborated upon here further.

Figure 4 shows the remote, Internet based information server IS in
25 greater detail. As illustrated, the server is arranged to receive, and deliver, signals to the Internet and includes a transmitter (Tx) and receiver (Rx) 40 for receiving information and queries from mobile telephones MS1 and MS2. In particular, the server supports a database 42 under control of a microprocessor (μ p) 41 wherein the database's records containing information
30 about the locations of mobile telephones MS1 and MS2 supplied to the database by the microprocessor.

The server may be queried in accordance with the present invention as illustrated in the following example scenario.

Suppose that a user in possession of telephone MS1 has received a text message from a friend, the user of telephone MS2, with whom the user is
5 intending to meet and appended to that text message is an encryption key.

Further suppose that a record relating to the location of telephone MS2 is maintained in the database held on the information server IS, the record including the number of telephone MS2 and an encrypted location of telephone MS2 previously determined and encrypted at telephone MS2 and
10 uploaded to the database.

The user of telephone MS1 connects to the Internet using their mobile cellular telephone in a conventional manner by transmitting and receiving data from the telephone MS1 via the base station BS1, a cellular network system controller (SC) and a public switched telephone network PSTN. The user then
15 accesses the information server (IS) via the Internet and queries the database held on the information server by sending the telephone number of telephone MS2 to the information server. The information server (IS) replies sending the encrypted location.

Upon receiving the encrypted location, telephone MS1 decrypted the
20 encrypted location of telephone MS2 using the encryption key previously appended to the text message send by telephone MS2. Telephone MS1 then generates an url to a mapping website and connects to that url to display to the user of telephone MS1 a map of the location where telephone MS2 is located. Thus, the user of telephone MS1 has been able to determine the
25 location of telephone MS2 without a third party being able to do the same.

At the time of writing, the mapping website <http://www.multimap.co.uk> enables an url to be created which if selected directs a user to a map of a predefined area. Similarly, the same website will also provide directions from one location to another and accordingly, the mechanisms for this functionality
30 are not described here in detail.

As an alternative to a GPS receiver above, other forms of positioning technology may be used including telephone network positioning such as E-OTD and other GPS type solutions such as GLONASS and GALILEO.

From reading the present disclosure, other modifications will be
5 apparent to persons skilled in the art. Such modifications may involve other features which are already known in the design and use of computer systems and component parts thereof and which may be used instead of or in addition to features already described herein. Although claims have been formulated in this application to particular combinations of features, it should be understood
10 that the scope of the disclosure of the present application also includes any novel feature or any novel combination of features disclosed herein either explicitly or implicitly or any generalisation of one or more of those features which would be obvious to persons skilled in the art, whether or not it relates to the same invention as presently claimed in any claim and whether or not it
15 mitigates any or all of the same technical problems as does the present invention. The applicants hereby give notice that new claims may be formulated to such features and/or combinations of such features during the prosecution of the present application or of any further application derived therefrom.

CLAIMS

1. A method of distributing the location of a mobile device comprising the steps of:

- 5 - determining the location of the mobile device
- encrypting the determined location using an encryption key;
- transmitting the encrypted location to a server;
- storing the encrypted at the server;
- querying the server from a remote terminal;
- 10 - transmitting from the server to the remote terminal the encrypted location in response to the query;
- sharing the predetermined encryption key between the mobile device and the remote terminal; and
- 15 - decrypting the location at the remote terminal using the predetermined encryption key.

2. A method according to claim 1 wherein the encryption key is not shared with the server.

20 3. A mobile device configured to determine its location, encrypt its location using an encryption key, transmit the encrypted location to a server, and share the predetermined encryption key with a remote terminal but not the server.

25 4. A server configured to received and store an encrypted location which is encrypted with an encryption key and corresponds to a mobile device; and in response to a query from a remote terminal, to transmit to the remote terminal the encrypted location; wherein between receipt and transmission of the encrypted location by the server, the server is not in possession of the
30 encryption key.

5. A terminal configured to query a remote server for the location of a particular mobile device with which it has shared an encryption key independently of the server; and upon receipt of an encrypted location encrypted with the encryption key, decrypting the location.

ABSTRACT

A METHOD OF DISTRIBUTING THE LOCATION OF A MOBILE DEVICE

5 A method of distributing the location of a mobile device is disclosed together with a mobile device, a server and a remote terminal for the same. The method comprising the steps of determining the location of the mobile device; encrypting the determined location using an encryption key; transmitting the encrypted location to a server; storing the encrypted at the
10 server; querying the server from a remote terminal; transmitting from the server to the remote terminal the encrypted location in response to the query; sharing the predetermined encryption key between the mobile device and the remote terminal (but not the server); and decrypting the location at the remote terminal using the predetermined encryption key.

15

[figure 1]

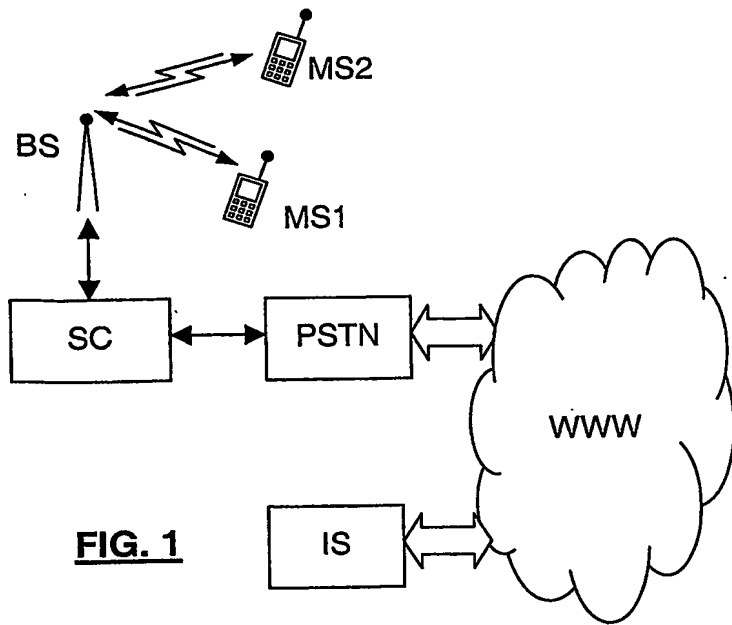


FIG. 1

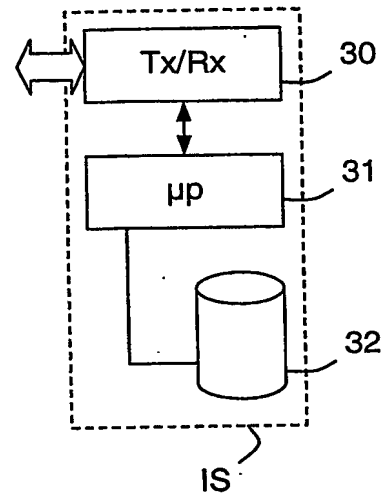


FIG. 3

FIG. 2

